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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/763,466	02/23/2001	Rory Stewart Turnbull	36-1411	7184

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EXAMINER

JACKSON, JAKIEDA R

ART UNIT	PAPER NUMBER
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2655

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/763,466

Applicant(s)

TURNBULL ET AL.

Examiner

Jakieda R Jackson

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) 11 and 12 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to because of minor informalities set forth on the attached "Notice of Draftsperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

New corrected drawings are required in this application because:

- Figure 2 is missing element numberings for 6 and 7. There is no verbal labeling for filter bank element 6 of figure 2.
- Figure 7, element 65 is labeled twice as a Layer4 multiplexer in the upper element and a shift register in the lower element. The lower element should be labeled 68, because Layer1 multiplexer is not labeled and should be labeled 67.

Specification

2. The specification is objected to because of the following informalities:
- A period is needed on page 1 line 3 in between the words "signals" and "More".
3. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

Art Unit: 2655

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Appropriate correction, by including section headings, is required.

Claim Objections

4. **Claims 11-12** are objected to because of the following informalities:
- The preambles of dependent **claims 11 and 12** are not consistent with those of **claims 1-10**. All claims should either be "An apparatus" or "A coder".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1, 4, 6 and 13-14** are rejected under 35 U.S.C. 102(b) as being anticipated by Todoroki (DE 197 13 059 A), also issued as U.S. Patent Number 5,850,419 (citations are for the United States version).

Regarding **claim 1**, Todoroki discloses a time diversity communication method and communication device, hereinafter referenced as a "communication device". Todoroki's communication device is an apparatus for transmission of signals (column 5, line 14) comprising:

a coder operable to generate a first output providing first data (column 5, lines 14-17) from which a decoder can produce a reconstructed signal and a second output

(column 6, lines 44-47) whereby a decoder receiving both the first and second data can produce a higher quality reconstructed signal (column 2, line 64, continuing to column 3, line 2 and column 6, lines 30-32).

means operable to assemble packets of data (blocks) for transmission (column 5, line 21), each packet containing:

primary data which includes the first data in respect of a temporal portion of the signal (signal bits) and the second data in respect of the same portion of the signal (k redundancy bits, abstract); and

secondary data which includes the first data in respect of a different temporal portion of the signal but lacks the second data in respect of that portion (column 5, lines 22-24).

Regarding **claim 4**, Todoroki's communication device different temporal portion is the portion earlier than that represented by the primary data (delayed signal, column 3, lines 24-26).

Regarding **claim 6**, Todoroki's communication device is operable to produce a plurality of outputs providing enhancement data, successive sets of enhancement data representing successive improvements (three or more input digital signals) to reconstruct signal quality, and in which the primary data includes all such outputs and the secondary data includes first data in respect of a like plurality of different temporal portions of the signal and progressively smaller number of sets of second data in respect of those portions (column 10, lines 25-31).

Regarding **claim 13**, Todoroki's communication device is an apparatus for reception of signals comprising:

means for receiving packets of data (figure 1, element 46 and column 3, lines 36-38), each packet containing:

primary data which includes first data in respect of a temporal portion of the signal and second enhancement data in respect of the same portion of the signal (Figure 6); and

secondary data, which includes the first data in respect of a different temporal portion of the signal (figure 6)

a buffer for storing the received packets (figure 5, element 16)

a decoder capable of producing a reconstructed signal from the first data alone and capable of producing a higher quality reconstructed signal from the first and second data together (figure 5, element 15 and column 3, lines 54-62 with column 6, lines 29-32).

control means operable to read from the buffer the primary data in respect of successive temporal portions of the signal and to forward them to the decoder and in the event that the primary data in respect of the temporal portion of speech be absent from the buffer, to read instead the secondary data in respect of that temporal portion and forward it to the decoder (column 3, lines 43-53 with column 6, line 63 continuing to column 7, line 6).

Regarding **claim 14**, Todoroki's communication device has control means that are operable in the event that secondary data in respect of temporal portion of speech

be absent from the buffer to read the second enhancement data, in respect of a temporal portion of the speech signal and forward it to the decoder (column 3, lines 43-53).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 2 and 3** are rejected under 35 U.S.C. 103(a) as being unpatentable over Todoroki in view of Campana (WO 95 06368).

Regarding **claims 2 and 3**, Todoroki discloses a communication device but lacks that the different temporal portion is the portion later than and the portion directly following the portion represented by the primary data. Campana suggest, in the abstract, that a first encoded information stream and a second encoded information stream is delayed by a time delay interval. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the communication device of Todoroki such that the different temporal portion is a portion later and a portion directly following the portion represented by the primary data to replace information that has been lost or rendered erroneous.

7. **Claims 5, 7-12 and 15-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Todoroki in view of Yamauchi (U.S. Patent Number 6,122,338).

Regarding **claims 5 and 15**, it is well-known to include in each packet a sequence code to indicate the temporal sequence of the primary data contained in the packets and control means operable to determine the temporal sequence of the packets by reference to the sequence code. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Todoroki's communication device by providing a sequence code when forming data into the packets so as to re-assemble possibly out of the sequence packets into proper time sequence, as suggested by Yamauchi (abstract).

Regarding **claims 7, 8 and 16**, Todoroki, as modified, discloses the claimed communication device but lacks the signals being audio signals and the coder being an audio signal coder, for example a sub-band coder, in which the first data include data in respect of lower frequency ones of the coder sub-bands, and the second enhancement include data in respect of higher frequency sub-bands.

Yamauchi discloses sub-band coders that break the incoming signal up into separate frequency bands (column 7, lines 36-38) and that the first data is in respect of lower frequencies (outline data) and the second data in respect of higher frequency sub-band (detail data, abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Todoroki's communication device such that the coder is a sub-band coder in which the first stream

consist of coarsely quantized samples and the second stream consist of additional bit of the same sample, to reduce the level of quantization noise for more audible bands.

Regarding **claim 9**, Todoroki discloses a communication device, but fails to disclose that the first data include binary representations of digital values and the second data include additional bits representing finer resolution of the digital values. Yamauchi discloses that the first and second data includes additional bits representing finer resolution of the digital values (multi-stage vector quantization, column 8, line 12). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Todoroki's communication device such that digital values are represented by the additional binary data to more accurately represent the audio data (high quality, abstract).

Regarding **claim 10**, Todoroki discloses an communication device but fails to disclose a sub-band communication device having sub-band filter means, nor bit allocation means and wherein the quantizer has a first output providing first data and second output providing second data both comprising at least one sub-band.

Yamauchi discloses a sub-band communication device comprising:

filter means to receive a sampled audio signal and to divide the signal into a plurality of sub-band signals each corresponding to a respective frequency sub-band (sub-band partition, figure 9, element 41)

a quantizer for quantizing the sub-band signals (figure 9, element 43)

bit allocation means for adaptively determining the number of quantization levels to be used by the quantizer in dependence on the signal characteristics (figure 9, element 46); and

wherein the quantizer has a first output for providing said first data, said first data comprising quantized values for one or more of said sub-bands, and a second output for providing said second data, said second data comprising, for at least one of the sub-bands in respect of which quantized values are provided at the first output, additional enhancement bits representing a less coarse quantization (multi-stage vector quantization) of the values for that sub-band or sub-bands (column 8, line 12). The examiner contends that it is known in the art that the quantizer has first data and outputs first data and second output for providing second data; and

wherein the bit allocation means is operable to perform a first allocation operation in which a first predetermined quota of bits for the first output is allocated among the sub-bands followed by a second allocation operation in which a second predetermined quota of bits, for the additional bits at the second output, is allocated among the sub-bands (figure 9, element 46).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Todoroki's communication device such that it has filter means to split the input signal into sub-bands, a quantizer to reduce the number of bits needed to represent the signal without degrading the perceived quality of the signal and bit allocation means, to obtain improved compression of speech and to accommodate audio signals.

Regarding **claim 11**, Todoroki discloses a communication device but lacks having the second output providing quantized values for at least one sub-band in respect of which quantized values are not provided at the first output.

Yamauchi discloses low-frequency data as first output and high-frequency data as second output (column 7, lines 61-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Todoroki's communication device such that the second output provides quantized values for at least one sub-band of which quantized values are not provided at the first output, for easier data compression of signals and to provide an efficient method of improving the quality of signals (high quality, abstract).

Regarding **claim 12**, Todoroki discloses a communication device but lacks that the quantizer has at least one further output and the sub-bands are not represented in any lower order output and bit allocation means operable to perform a number of operations equal in number to the number of outputs.

Yamauchi discloses that the quantizer has at least one further output and the sub-bands are not represented in any lower order output (column 7, lines 61-65) and bit allocation means operable to perform a number of operations equal in number to the number of outputs (column 8, lines 13-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Todoroki's communication device such that there is better approximation and less quantization error (high quality, abstract). Since it is obvious to add a third vector quantization stage

in Yamauchi's multi-stage vector quantization, this is suggested also for sub-bands not represented in lower-order output, ^{to} and produce higher-quality approximations.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,956,674 to Smyth et al. discloses encoding and decoding audio signals that employs filters.

U.S. Patent No. 5,692,102 to Pam discloses a process for low bitrate audio compression.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R Jackson whose telephone number is 703.305.5593. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00 p.m.

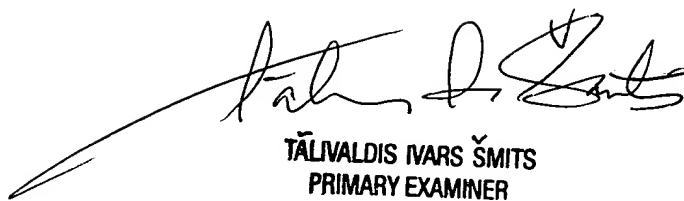
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached on 703.305.4827. The fax phone numbers for the organization where this application or proceeding is assigned are 703.872.9314 for regular communications and 703.872.9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.9600.

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JRJ
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TĀLIVALDIS IVARS ŠMITS
PRIMARY EXAMINER